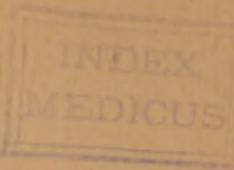


DAVIS (W. E. B.)

ANNUAL LECTURES



DELIVERED BEFORE THE

ALUMNI ASSOCIATION

OF THE

College of Physicians and Surgeons of Baltimore,

APRIL 11TH AND 12TH, 1892,

BY DR. W. E. B. DAVIS, ✓

PRESIDENT TRI-STATE MEDICAL SOCIETY OF ALABAMA, GEORGIA AND TENNESSEE; SECRETARY  
SOUTHERN SURGICAL AND GYNECOLOGICAL ASSOCIATION; FELLOW AMERICAN  
ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS; HONORARY  
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Two years ago the ALUMNI ASSOCIATION OF THE COLLEGE OF PHYSICIANS AND SURGEONS OF BALTIMORE, with the view of rendering their annual reunion more interesting and profitable, invited Dr. Lewis S. McMurtry, of Louisville, to give two lectures upon the Pathology, Diagnosis and Treatment of Extra-Uterine Pregnancy. Dr. McMurtry's lectures gave so much satisfaction to the members and invited guests that at the succeeding meeting Dr. W. E. B. Davis, of Rome, Ga., one of the most distinguished surgeons of the South, was invited to address the Association. He chose as his subject "Local and General Peritonitis," a subject of vital interest to every practitioner. Dr. Davis's lectures as printed in the following pages form a valuable monograph of Peritonitis from the most modern standpoint.

The subject of the lectures for 1893 has not yet been decided upon. Due notice will be given through the medical press.



# LOCAL AND GENERAL PERITONITIS.<sup>1</sup>

By W. E. B. DAVIS,

President of the Tri-State Medical Society of Alabama, Georgia and Tennessee; Secretary of the Southern Surgical and Gynecological Association; Fellow of the American Association of Obstetricians and Gynecologists; Honorary Member of New York State Medical Society, etc.

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*Gentlemen:*—The subject I have selected is a very familiar one. So much has been written on it during the past few years that any further contributions would seem supererogatory, but it must be remembered that a large majority of the profession do not regard this disease as do the abdominal surgeons. Those who are opening the abdomen constantly and seeing its diseases as they are have learned that peritonitis is not a disease distinct, as taught by Bichat, but that it is nearly always due to some well-recognized lesion of the abdominal viscera. A large proportion of the profession, and of those who see these cases first, still regard the disease as a distinct affection, and therefore their treatment is based on this conception of the disease and is usually followed by a fatal issue. Too much praise cannot be given Habershon, who showed so conclusively, by his post-mortems in Guy's Hospital, that a cause could nearly always be found for peritonitis,—that there was a perforation of the appendix, a rupture of an abscess, a leakage from a pus-tube, a perforation of the gall-bladder, of the intestine, or a tubercular disease, or some other well-recognized lesion at the bottom of nearly every case of peritonitis. Of course there are certain constitutional affections which predispose to the disease. Diseases of the kidney may cause peritonitis. We may also have a peritonitis as a result of a malignant growth in the abdomen.

There has been much confusion over the terms septic and simple peritonitis. Especially has the general physician been confused over the teachings of the surgeon, inasmuch as the surgeon too often fails to differentiate between these two diseases and fails

<sup>1</sup> The "Alumni Lectures" for 1892 of the Alumni Association of the College of Physicians and Surgeons, Baltimore.

to teach that they are very different inflammations, due to different causes.

A septic germ may cause a local inflammation which does not go on to pus formation, and on the other hand a simple inflammation, with very slight septic infection, may go on and result in pus formation. We may have salpingitis, due to septic germs passing up through the uterine canal into the tubes, but the germs are in such small number and the tubes in such a healthy condition as to resist suppuration, and there may result inflammation which will simulate a local, simple peritonitis. On the other hand, traumatism to the uterine canal may cause such inflammation that, should there be any septic germs in the tubes from an old inflammation, or infection, that this new inflammation of the uterus will result in suppurative inflammation of the tubes. A simple, irritative, non-suppurative inflammation of the peritoneum may result, or terminate, in a septic peritonitis by producing a *locus resistantiae minoris* in the peritoneum, or by producing paralysis of the intestinal walls, thus allowing septic germs to pass from the intestine into the general peritoneal cavity. Obstruction of the bowel thus gives rise to a septic peritonitis.

In a simple peritonitis there is thrown out an exudation lymph which offers a splendid nidus for the development of septic germs, and in the presence of a simple inflammation a very few septic germs will cause septic inflammation of a very fatal character.

That there may be no confusion over the terms septic and suppurative peritonitis, as used in this paper, it may be well to state that it is conceived that their etiology is the same, and that every septic peritonitis would become suppurative if time permitted; for both are due to the same microbe. Many cases of septic peritonitis are cut short by the power of the organism to take up the germs and destroy them. In other cases the infection is so profound that death is produced in a few hours from toxæmia, before there has been any collection of fluid in the peritoneal cavity; still others die from hemorrhagic peritonitis in from twelve to forty-eight, or even seventy-two hours, before the fluid has become purulent; but, when life is prolonged till after seventy-two hours, and sometimes after forty-eight, the fluid in the cavity will be purulent.

When quarts and gallons of pus are reported as having been removed from the general peritoneal cavity and recovery followed, I believe that the pus has usually resulted from a local collection

which has ruptured into the general cavity, and the operation has been done before sufficient time had elapsed for this amount of pus to result from the septic inflammatory process in the general cavity. It is easy to understand how a gallon of pus which has been shut off from the general cavity by inflammatory exudations and adhesions, and which has only recently ruptured into the peritoneal cavity, can be removed and recovery follow; and it is not difficult to comprehend how this condition might be mistaken for acute, general, suppurative peritonitis, with a gallon or a quart of pus as a result in the cavity; as the pus, by its irritating properties, will produce an inflammation which would be misleading: but the condition is quite different from what would be had if the pus had been the result of a general inflammation. True, there would be many grave symptoms, but not that extensive local inflammation and fatal toxæmia which would result from a peritonitis which had existed long enough to give rise to so large a quantity of free pus in the cavity.

Pathological and clinical study, combined with bacteriological and experimental research, has demonstrated conclusively that by the time a general peritonitis has become purulent there have resulted such destructive local effects and so profound a general infection that the condition must be considered fatal.

A suppurative, or purulent, peritonitis is usually localized; in other words, a septic inflammation that goes on to pus formation is, as a rule, a localized inflammation, and the pus is limited by inflammatory adhesions so as to protect the general cavity from infection. A septic inflammation that involves the general peritoneal cavity will generally produce death before pus has had time to form, and hence septic inflammation, as a rule, must be localized in order for the patient to survive long enough for pus formation. Fortunately the most frequent class of septic peritonitis is the localized purulent form, which is due to protective adhesions being established before the rupture of the tubes, a perforation of the appendix, the gall-bladder, or of the bowel, etc.

Furthermore, small quantities of fluids will be shut off by rapid formation of protective adhesions when there have been no preparatory adhesions. However, when gas escapes without preliminary protective adhesions a peritonitis of the gravest form usually results, the gas being so diffusible that it rapidly involves the whole cavity. I have seen cases of death from this form where there was no lymph thrown out from the inflammation.

A few months ago I operated on a man at Collinsville, Ala., who had all the symptoms of approaching death from obstruction of the bowel, and found a long appendix with a small opening which had permitted the passage of gas, and as a result there was a diffused peritonitis without the presence of fluid formation in the cavity. I have also noticed this several times in my experiments on animals.

In recent years much has been learned about the etiology and treatment of this disease from bacteriological, experimental and clinical study. The following points have been pretty well settled by this class of work:

A simple peritonitis may produce death from the extent of the inflammation, which is dependent upon the amount of traumatism or of the chemical irritant, and upon the condition of the peritoneum.

A septic inflammation is always produced by pus germs, either directly or indirectly, and it has been shown that in inflammation produced by pus germs, cultures made from the products of this inflammation would produce a similar inflammation in other animals, while the products of a simple inflammation would not produce cultures capable of causing an inflammation.

The peritoneum in a healthy condition can take up a moderate number of septic germs and destroy them, no peritonitis resulting; while a peritoneum weakened by some antecedent trouble would succumb to the same number of germs and a fatal peritonitis would be developed. The number of germs introduced into the cavity with a chemical irritant which would cause the pouring out of lymph, and cause a fatal peritonitis, without a chemical irritant, would be taken up and destroyed.

Much depends upon the condition of the peritoneum and upon the manner in which germs are admitted into the peritoneal cavity. For this reason many cases died from septic peritonitis when it was the custom to use chemical solutions for irrigating the abdominal cavity.

Where there are sufficient germs to produce a general septic peritonitis, if death results in twenty-four to forty-eight hours, there will be a hemorrhagic inflammation. I have often seen this occur in my experiments on animals. If the animal lives more than three days there will be a purulent peritonitis. If it dies in twenty-four hours there will frequently be an intense congestion without much fluid in the cavity, which would show that the in-

fection had been so great that the animal had succumbed early to the poison and shock.

Some of the most rapid forms of infection produce death without a very marked localization, the system being overwhelmed with the septic germs.

A simple inflammation must be very severe in order to produce death. I have seen some very violent simple inflammations recover, and it is just here that the general physician, and also the surgeon, get the treatment of peritonitis confused. The general physician thinks that most cases can be cured by opium and rest, or that all cases that can be cured at all can be cured in this way; while the abdominal surgeon claims, in a general way, that when you get peritonitis you have a disease for the surgeon, and so the confusion goes on and the patient is the sufferer. What is necessary is to convince the general physician of the nature of the disease, and to show him that the surgeon does not consider that in all cases surgical procedures are necessary, but, above all things, that the disease is a surgical disease, and that a surgeon should be sought as a consultant in these cases, and that he should be called early and not after the patient is practically dead. It may be said with truth that the surgeon is to blame, in a large measure, for the general physician's failure to properly regard peritonitis. The contributions on this subject have been too general in their tone. In other words, they have generalized too much and particularized too little. They have not distinguished, nor has there apparently been a great effort to draw the line, between the cases in which surgery should be resorted to and those cases in which it is not necessary.

It is impossible, in many cases, to determine the nature of the inflammation. I recollect a case in point which I saw at Alice Furnace in Birmingham, Ala., three years ago. The man had been caught between the furnace elevator and the wall of the building and mashed severely and then dropped thirty feet on a stone floor. He had retention of urine and involuntary passage of feces for the first twelve hours. After that time his bowels would not move and his legs became very markedly paralyzed. His abdomen became more and more tympanitic until he could scarcely breathe. His pulse on the third and fourth days ran from 135 to 150. It looked as if death was inevitable. By the persistent use of calomel and enemas of salts and glycerine his bowels were finally induced to move several times, and then his

symptoms rapidly improved. This was a simple peritonitis due to traumatism and the patient ran the greatest risk of losing his life. An operation would have been resorted to, but owing to the injury to the spinal cord it was not deemed prudent. The result in this case shows that it was clearly one of simple peritonitis and that the operation was not necessary.

Frequently large quantities of fluid will be poured out into the peritoneal cavity, as a result of a simple peritonitis, due to a strangulated bowel, the inflammation extending from the seat of obstruction of the general cavity. I have seen large quantities of fluid in the cavity from this condition. I remember to have operated on a young man at North Birmingham for strangulated inguinal hernia, in which I did McBurney's operation, and there was more than a quart of straw-colored fluid in the cavity, the result of a simple inflammation due to strangulation.

Above all things an attempt should be made to, as near as possible, outline the symptoms of the disease and to so classify the different forms, according to etiology and treatment, that the general physician may understand the value of having the assistance of a surgeon. He should also be made to realize that he should not resort to opium or to any remedy that will so mask the symptoms of the disease that the patient will go on and die, feeling comfortable, without a diagnosis having been made.

In a general way, when a physician is called to a case of beginning general peritonitis, where he cannot determine the cause, it is better to purge his patient freely, and if the symptoms are not much improved after free purgation he may conclude that he has a general septic peritonitis, but if they are improved he may know that the inflammation was either a simple inflammation, a septic inflammation just beginning, or a localized septic inflammation with tympanites. The pain of a localized inflammation will always be ameliorated by free purgation. A woman with a large pus-tube or a pelvic abscess will feel easier after the bowels have been made to move six or more times, and a man with appendicitis with inflammatory lymph thrown out around the head of the colon will feel much better after the same treatment.

Localized inflammations in the abdomen give less pain when the bowels are kept well open, and in those cases where we have tympanites accompanying a localized inflammation of the abdomen, and where it is doubtful whether or not there is present a general peritonitis, purgation relieves the tympanites and enables

one to locate the disease; as all the symptoms simulating a general peritonitis will have been relieved by the purgative, and the tenderness will then be confined to the area of the localized inflammation. So, aside from its curative value, the purgative treatment of peritonitis is a most valuable diagnostic measure. It enables us to say whether there is a general or localized inflammation or not, although it is not possible in all cases to say whether or not there is pus. Of course, should we have a general septic peritonitis revealed by the failure of purgation to relieve the inflammation, generally there is then very little hope of relief from surgical procedure, for the inflammation, by that time, will have become so general and so intense and the system so infected that the disease is incurable.

The treatment of peritonitis will depend largely upon its etiology. If a salpingitis be the cause of severe recurring attacks, then the appendages should be removed. If an appendicitis be the cause of frequent attacks of peritonitis, then the appendix should be extirpated; and these are the two most frequent causes of the disease. Should a man have peritonitis we would at once suspect the appendix to be the trouble. In a woman we have both to contend with. She also has to suffer from the misconceived treatment of a host of so-called gynecologists who think they see the origin of all her pains on the inside of the uterus—that a constricted cervix and a misplaced uterus are the only things to be remedied; and in their efforts to correct what is a natural condition they more often produce a major disease. But I would not be understood as saying that the sound has no place in gynecology, that the uterine dilator should never be used, or that the carette is not a valuable instrument, or that Emmet's operation should be abolished, and that electricity is not a valuable therapeutic remedy; for I believe all of them have their places and that all of them should be used. The abuse of a remedy or of a surgical procedure should never be any argument against its proper use, and because it is a well-known fact that the abuse of minor gynecological operations has been the cause of many pelvic inflammations, with pus-tubes, ovarian abscesses etc., that is no argument against their proper use. The woman has also to suffer from the misdeeds of her husband. She is thus infected from gonorrhea, and these germs, combined with others of a more infectious nature, give the most severe forms of inflammation.

Puerperal infection, however, is the principal source of pelvic inflammation. Perhaps in the lower classes gonorrhœa may play the most important part, but taking all classes, especially those in the higher walks of life, child-bearing and abortion are the most frequent source of this disease.

In the mild cases of pelvic inflammation there may be no need for other than local and constitutional treatment, and just here I will say that I am not in accord with those who believe that where there is any evidence of mild pelvic trouble that the uterus should not be entered. I think, frequently, in cases of mild pelvic inflammation, due to endometritis, that the pelvic trouble can be relieved, certainly it can be benefited, by curetting the uterus and draining it. The endometritis which has caused the pelvic trouble, if not relieved, will only serve to increase the salpingitis. However, I would not treat the uterus thus during acute attacks of pelvic inflammation.

Severe recurring attacks of peritonitis, due to the tubes and ovaries, call for the removal of these organs, and nothing short of this will relieve the patient. In every attack the woman runs the risk of a general peritonitis, besides enduring the great suffering and inconvenience caused by these frequent recurrences of inflammation.

There is no division of opinion as to the propriety of removing pus-tubes and ovarian abscesses. It is a settled question that pus should be gotten rid of, but there is considerable doubt by the profession at large of the propriety of removing inflamed tubes and ovaries where there is no pus. It is also a well-known fact to the gynecologist that the operation for the removal of these organs, for the relief of pain where there is no pus, does not give the satisfactory results that we get from removing pus-tubes or from the evacuation of a pelvic abscess, together with the removal of the tubes and ovaries, unless the pain and recurring attacks of inflammation occur at the monthly periods; then by the removal of the ovaries and tubes the monthly flow is stopped and the attacks of inflammation are relieved together with the pain.

In cases of pelvic peritonitis the pain between the attacks is frequently due to adhesions, and the failure to give relief by an operation is due to the fact that adhesions so often reform after the operation.

The cellulitis doctrine is a thing of the past. The abdominal surgeon scarcely ever sees a pelvic cellulitis as a primary disease.

The cellulitis is usually secondary to disease of the tubes. We sometimes have a cellulitis from puerperal infection, but usually this is accompanied by pelvic peritonitis.

The teachings on puerperal inflammations have been very confusing. An author, in a recent system of obstetrics, still holds to the opium treatment of "puerperal fever," and hence, with such high authority advocating this treatment, there can be no wonder that a large number of the masses of physicians are willing to follow such instructions,—a doctrine which means death to those women thus afflicted. It is a want of union on the part of teachers that is causing so much harm. The obstetrician who never sees on the inside of the abdomen does not regard the disease as does the abdominal surgeon, who sees the disease as it is, and hence the great variance in the teachings of the two. Puerperal peritonitis should be regarded and treated as septic peritonitis from any other cause. It is due to infection from a septic germ, the same as that of surgical septicemia, and the localized inflammations from this cause require the same treatment. A general puerperal peritonitis will generally prove fatal. It is doubtful whether there are any cases of general puerperal peritonitis—those cases occurring soon after delivery—which are ever cured, for by the time the peritonitis can become general the system has become so infected that surgery can offer no relief. The system is often infected without any local manifestation whatever, and hence no operation could offer relief. I have seen the abdomen opened in a case of this kind in which there was no local manifestation from the sepsis, except a moderately enlarged uterus.

Some time ago I was called in consultation in such a case by Dr. Copeland of Birmingham, to see a woman who had been confined two weeks previously, who had a temperature from 102 to 104, which had begun soon after delivery. No local trouble could be found. The uterus had been curetted, but this gave no relief. I agreed with the doctor that we might find something by opening the abdomen, but nothing was found. The woman was suffering from pure septicemia from puerperal infection. I would not advise an operation in a similar case, as puerperal fevers that do not show some local trouble cannot be benefited by an operation.

The cases of peritonitis shortly after delivery, in which an operation has succeeded in curing the patient, have no doubt been cases of ruptured abscesses or pus-tubes which existed before delivery and which were injured during the process of labor.

There are many cases of peritonitis, more than we have been led to believe, following delivery, due to this cause; and that brings up the question of the dangers of pregnancy with a pelvic inflammation. Pelvic inflammations are seldom benefited by pregnancy unless they be of a very mild character. Severe inflammations are usually made worse, and it is not an unusual thing, where a woman has suffered very much with localized pain during gestation, that she will have fever after delivery, which is due to an old salpingitis, and should there be pus in the tube, the tube is very liable to be ruptured and the pus emptied into the abdominal cavity, causing a general peritonitis, unless an operation is done very promptly, and it is not usual for the symptoms to be clear enough to warrant the surgeon in operating in time to save life. Perhaps when more attention is given to this particular complication of pregnancy the surgeon may be called in at a time when an operation will be decided on earlier than has been the practice heretofore.

As stated, puerperal inflammations that are amenable to surgical procedures are those that are localized. They are cases that are operated on some weeks after delivery, and not cases of the so-called "puerperal fever," which kills within four to ten days. A peritonitis that does not kill within a week or ten days may be regarded as localized, and such cases always offer a chance for recovery if surgical procedures are adopted. There are many of these cases of large pelvic abscesses with septic infection where the patient is so exhausted that nothing can be done more than to evacuate the pus, wash out the abscess and drain so as to give the patient time to sufficiently recover to have the ovaries and tubes removed, which are the cause of the disease and which make it impossible for the patient to be entirely well until they are extirpated. It may be said, however, that often after the evacuation of the pus of an abscess that the tubes are so much relieved that it does not become necessary to extirpate them, they having been drained through the abscess, just as we sometimes have, and I may say frequently have, an appendicitis cured by a perityphilitic abscess. The appendix rupture causes an abscess, the abscess is opened and drained, and the appendix being drained through the abscess, is relieved to that extent that it does not give further trouble.

It should be remembered that puerperal fevers, as pointed out by Charpentier, are of two great classes: one in which nearly all

cases die, the other in which nearly all cases get well if properly treated. In the first class are those cases in which the whole system is rapidly infected before there is any local evidence of inflammation, and under the same heading are those in which there is a general peritonitis with general infection. Under the second class may be placed those cases of mild general infection with localized inflammatory troubles. In the last class, where the disease is limited to the pelvis, we have a fertile field for the surgeon, and much good has already been accomplished in this class of cases. My own experience in this line has been very satisfactory. I have operated on cases where the pulse was 135 and seen them recover.

In 1889 I did an operation on Mrs. M. of Green Pond, Ala., for Dr. Pain, six weeks after her delivery, and removed nearly a gallon of stinking pus. When I saw her she was nearly dead. The abscess was opened, washed out and thoroughly drained. It was necessary to support her by rectal alimentation for ten days. Her pulse ran up to 150 to 160 shortly after the operation. She is now entirely well and has no trouble with her ovaries and tubes.

Recently I operated on a woman, for Dr. Sexton of Birmingham, Ala., whose pulse was over 130 and who looked to be in almost a dying condition. I removed more than a half-gallon of pus in this case. One half of her abdomen, the left side, was an abscess. She was infected from an abortion. She had an uninterrupted recovery and is now entirely well.

After these operations, which may be considered incomplete, we often have to do a more thorough one later for the removal of the diseased tubes and ovaries.

Frequently a fever, from puerperal infection, may continue for weeks where there is no pus formation and in which an ovary is greatly enlarged and the broad ligament thickened with occlusion of the tube. I have operated on such a case where the tissues were so soft that my ligatures would cut through and it was necessary to take up the vessels and ligate them separately. An ovary in this condition is septic as if it contained pus.

In a large proportion of cases the pains felt in the pelvis following delivery, after or before, are due to adhesions of the omentum, intestine and ovary and tube, and when an operation is made to evacuate pus we will often find, instead of pus, this condition present; but when fever is kept up and the patient's condition shows sepsis, it is wiser to open the abdomen, break up the

adhesions and remove the diseased appendages, which are keeping up the infection.

In cases of localized inflammation from appendicitis, with pus formation, the abscess should be evacuated, and where the appendix can be easily reached without breaking up adhesions it should also be removed. Frequent recurring attacks of appendicitis should call for the removal of this organ, as there is no telling what time a general peritonitis may be the result and the patient's life lost.

The pathology of this affection in the early stages has been well taught by early operations. We could never judge of the real condition of the appendix in early disease by post-mortems, but operations in the early stages have demonstrated all of the pathological conditions to be encountered during the progress of the inflammation. As a rule, an inflammation in the ileo-caecal region is appendicitis. It is intra-peritoneal, and a patient's life is always endangered from an attack of this kind. Hence, where there are severe attacks of recurring appendicitis the operation should be decided upon and done, either between the attacks or it should be agreed between the physician and patient that it should be performed at the next attack, so that the patient would still have the benefit of every chance of recovery should the appendix rupture into the cavity, inasmuch as the surgeon would have the opportunity to wash out the abdomen and drain it. I have recommended that the operation be postponed until an attack, from the fact that it is not an easy matter to get a man to submit to an operation when he is free from pain and in comparatively good health; while on the other hand, when he is suffering from another attack of the disease, the dangers of which have been explained to him, it is not difficult to convince him of the importance of being operated on. Should anything happen to the patient after an operation during an attack, the family would regard his death due to the severity of the inflammation and not to the surgical procedure, which is a very important point to the surgeon and to surgery, because it is necessary to keep surgery in as high esteem as possible with the people, in order that as many as possible who need an operation may be willing to accept it before the disease has continued until the patient cannot hope to have the best results from a surgical procedure.

I do not believe that all cases require operation. On the contrary this is not necessary, for many get well without it, and my

purpose is to insist on a thorough study of every case so as to be able to say when an operation should be resorted to and when we may wait on the disposition of nature. In other words, there are cases that need no operation and others that will run the greatest risks without it, and it is necessary to give them such careful study and close attention that the fewest mistakes shall be made. The physician should be thoroughly aroused as to the gravity of every attack of inflammation in this region. He should not be unconcerned because he has seen several cases recover without operation and heard of others dying from late operations. I say, late operations, for the per cent of mortality after surgical procedures is very low except in those which have been neglected. It has been well said that it is the early alarm and anxiety on the part of the attending physician that saves the largest number of these cases. Frequently have I had physicians say to me, if they had been suspecting a perforation of the appendix or the rupture of an abscess that they would have recognized the condition, but that the patient had often complained and, without a thorough examination, morphine was given and the case not seen again for many hours. If the physician had been on the "lookout" for appendicitis, as one expressed it to me, he would not have made the fatal mistake. I have been called to a number of these cases in which obstruction of the bowel had been diagnosticated, and found that the physician had given the patient hypodermics of morphine to relieve the pain, for two or three days, and then on attempting to get the bowels to act, and having failed, he concluded that he had invagination of the bowels. It is not possible to say positively in every case just what we have and when surgery should be resorted to, still, by giving every suspected case our closest attention, the mortality can be reduced to a marvelously low per cent. I would not be understood as counseling every practitioner to operate. Abdominal surgery is successful just in the ratio that it is practiced by those of experience, and if a physician has not been trained in this work he should not undertake it unless the circumstances be very exceptional; and hence what I say will be based upon the results of those who have had experience in abdominal operations. Of course there are many cases where the tumor is prominent and the operation is no more formidable than incising a simple abscess, there being no danger of getting into the general peritoneal cavity, but I have seen a number of cases of what seemed to be this form of abscess where

an incision would have incised the bowel; hence experience in abdominal work is necessary to give the patient in every instance the best chance. Recently, within one week, I operated on two such cases. One, a boy six years of age, was brought to my office by his father and physician, with the history that he had been suffering for several weeks with his right hip and thigh. He could not extend his thigh. I found quite a pronounced swelling in the right iliac region, and there was every appearance of an abscess which had become attached to the abdominal wall. It looked like a proper case for the Willard-Parker incision. The boy was sent to the Birmingham Private Infirmary and operated on within two hours after I was consulted at my office. The intestine was found in front of the abscess and firmly attached to it. There was no adhesion to the abdominal parietes, and after the abscess was opened and the abdomen flushed the abscess cavity was packed with iodoform gauze. The gauze was left in for three days, which gave abundant time for protective adhesions to form. Had an incision been made down on the abscess it would have been emptied into the abdominal cavity and the intestine would have been cut.

The other case was seen with Dr. Killough of Huffman, Ala. Four weeks previously the woman had been seized with great pain in the right iliac region, which had been followed by the slow development of a swelling in this region. The swelling extended low down in the pelvis and could be felt in the vagina. There was some doubt as to whether it was an ovarian abscess or due to the appendix. An incision revealed that it was due to the appendix, and, notwithstanding the long duration of the trouble, there was no attachment to the abdominal wall. The intestine was in front of the tumor and its serous coat was cut in opening the abscess. After taking stitches in the bowel, the abscess was opened, washed out and packed with gauze. Both patients recovered.

These cases show the importance of being prepared, in all abdominal abscesses, for all the complications and emergencies of a section.

Clinically, we find that inflammations in the caecal region do not always run the same course. There is a very great variation of symptoms, which can only be explained by studying their origin. We no longer accept the teachings of Bamberger in 1853, and Oppolzer in 1863, who taught that these inflammations

originated in the connective tissue posterior to the caecum, and that perityphlitis meant extra-peritoneal inflammation. Treves, Bardeleben and Luschka, through their dissections, have shown that the caecum and appendix are entirely covered by peritoneum, and that one cannot open the caecum and appendix without opening the general peritoneal cavity. Fitz, Weir, Bull, McBurney and With have demonstrated that all these inflammations, with very few exceptions, originate with an inflammation of the appendix *vermiformis*.

The causes of appendicular inflammation are the extension of a catarrhal inflammation into the appendix, which may close the appendico-caecal opening and prevent the return of the mucus and other contents into the caecum. Small fecal masses may enter the appendix, and not being returned, their fluids are absorbed, leaving hard, stone-like substances which act as foreign bodies and cause irritation, inflammation and often ulceration, with perforation or contraction of the caliber of the appendix. These fecal masses are often incrusted with lime-salts, and thus the little "fecal calculi" are formed. Extraneous bodies, like little seeds, very rarely enter the appendix and cause inflammation. Intestinal germs doubtless play an important part in the production of this disease. As Gerster has said, where ulceration processes have led to the formation of permanent cicatricial contraction, the appendical trouble is apt to persist after the cessation of the causal disorder.

Clinically, as pointed out by Weir, we observe the following types of the inflammation: There may be slight or acute and persistent pain with tenderness in the right iliac region, which is accompanied by some fever, constipation and retching. This is not associated with a tumor, and gradually gives way, the pain on pressure being most marked over the region of the appendix. In another class we may have the patient suffering pain of a variable character, and soon a tender swelling is recognized. There may be but little fever and but slight general peritoneal symptoms. Perhaps there will be some obstructive symptoms. By the use of laxatives and local applications all of the symptoms slowly disappear. In still another class we may find a patient with all the symptoms of the former, there being no general abdominal pain, only parietal rigidity with a swelling which soon develops into an abscess. In another class the patient may be attacked with very severe pain which rapidly spreads over the

abdomen with marked symptoms of shock, profuse sweating, pallor of the face, quick, thready pulse, etc., but the general peritoneal tenderness remains overtopped by the original pain. As this subsides a tumefaction is formed in the iliac fossa which goes on and forms an abscess. In another class the pain rapidly extends, and the general peritoneal tenderness overtops the local pain, and the patient rapidly dies in from two to five days from general septic peritonitis.

Bearing in mind the symptoms already narrated, and especially the local tenderness on palpation, which is confined to a small area, two inches from the spine of the ilium, on a line with the umbilicus, there can be but little doubt of the existence of an appendicitis. Inflammation in the right ovary can usually be determined by bimanual palpation. If the symptoms begin to improve within twenty-four to forty-eight hours and no tumor appears, it is evident that there is simply a catarrhal inflammation of the appendix, but should there be very intense pain, considerable fever, retching and rapid pulse, which does not improve in thirty-six hours, it is safer to cut down on the appendix and remove it, if it is not so attached as to involve great danger in its extirpation. The patient may recover without the operation, but since these severe symptoms so often precede a perforation, which may cause a dangerous abscess or a general peritonitis, it is much safer to give the patient the benefit of an operation the mortality of which is very small, not more than four per cent. Should the symptoms after the first forty-eight hours be accompanied with a swelling in the iliac region, we should be contented to wait from three to five days, when this enlargement will often begin to give way and the patient will go on to recovery, the tumor being due to a sero-fibrinous exudation. Should the symptoms, however, not improve by the fourth or fifth day, pus may confidently be expected and an incision should be made and drainage established. There will be very few alarming symptoms where the appendix has been shut off by adhesions before the perforation and extravasation, and in those cases where the inflammation goes on to local pus formation, without any very marked general peritoneal symptoms, it may be inferred that such adhesions have taken place.

In those cases where swellings can be made out in the region of the appendix, and where there is protracted convalescence extending over two or three weeks, it may be inferred that pus

had formed and that the abscess had opened into the bowel. A swelling that continues more than four days in this region will generally contain pus, and hence the danger of drawing favorable conclusions from those cases which have gotten well after a protracted convalescence.

I operated on a man in the Birmingham Hospital of United Charities who had gotten up after a four weeks' attack of this kind. He was taken down again with pain in the right iliac region and high fever. The operation revealed a large opening in the head of the colon, near the base of the appendix, the appendix being almost destroyed. The pus had been partially drained through this opening, but so slowly and incompletely that the kidneys had become infected from the abscess. After the operation the man lived a week, dying from pyelo-nephritis. At the autopsy pus could be pressed out of both kidneys.

The hypodermic syringe is unreliable for diagnosis. I recall many cases that were not operated on through the failure of the syringe to reveal pus.

These abscesses should be evacuated if possible without entering the general peritoneal cavity, and with but few exceptions this can be done by seeking the place of their attachment to the peritoneal wall. In the ileo-inguinal type there is but little danger of opening the general cavity, if ordinary care is exercised. The incision is made parallel with Poupart's ligament and a little to the inner side of the spine of the ilium over the swelling. The tissues are incised layer by layer, and the attachment of the abscess will be recognized by the discoloration and condensation of the deep tissues. This type of abscess is fortunately the most common and is due, according to some authors, to the frequent location of the appendix in this region. After the abscess has been opened its cavity should be very gently and carefully examined and washed out, and either iodoform gauze or soft drainage tubes introduced.

The anterior, parietal type comes next in frequency and the tumor is behind the right rectus muscle. It may extend above the navel and beyond the median line. Frequently the induration can be felt extending into the ileo-inguinal region. In operating for this form of the abscess the incision should be made according to the location, and when there is some doubt as to its attachment it has been recommended to make a very small median incision and with the finger determine the point to make the opening, so

as not to get into the general peritoneal cavity. However, I consider this unnecessary. Some abscesses point toward the rectum and should be drained from below. I have seen a number of these cases. Some are bound in by the intestines and have no attachment to the abdominal wall. They should be aspirated, opened, thoroughly cleansed, rubber drainage-tubes introduced and then be packed with iodoform gauze. The gauze can be removed on the third day, and the tube as soon as the discharge becomes serous.

In this connection I will report the case of a young physician who had several attacks of appendicitis and whom I advised against an operation, who finally passed through all the stages of the disease. He read a paper reporting his own case and predicted that he might at some time have to submit to an operation, which proved true. In July he made a further report of his case to the *Alabama Medical and Surgical Age*, as follows: "Since reading that paper I have been so unfortunate as to have another attack of appendicitis, resulting in an abscess, and so fortunate as to pass successfully through the attack. Ever since March, 1888, I have frequently experienced what I thought was a fresh attack of appendicitis, but have been able to avert it by the prompt use of salines. On April 12th, 1891, a dull pain in the region of the appendix was felt, but was disregarded for some time. It grew worse during the day, and resort was had to Epsom salts, but the symptoms grew very much worse and I was compelled to go to bed. Dr. W. E. B. Davis was summoned. His diagnosis was that of appendicitis, and the saline treatment was continued. At this time my pulse and temperature were above normal. On applying McBurney's test, the pain was more severe at this point on pressure. It grew so excruciating that it was almost beyond endurance. The bowels were frequently purged, but the symptoms grew worse instead of being relieved. Pain still very severe. Temperature about 101 degrees; pulse about 115. Morphine was used to relieve the pain, and during the day—the 13th—my condition grew worse, and on the night of the 13th, while at stool, a very acute and lancinating pain appeared in the iliac region. Chloroform and morphine were resorted to and I passed a comfortable night. After that I was troubled with very little pain for more than a week. Enemata of sweet oil were given and some hard concretions were removed from the colon. Was placed on a pepsin mixture and symptoms closely watched. A daily exa-

cerbation of temperature and most of the symptoms of typhoid fever were present. After about two weeks a constant pain appeared in the region of the appendix. . . . I continued to grow worse, temperature getting higher and pain more severe, extending down into the testicles. There was no tumor anteriorly, but it could be made out by Dr. Davis by rectal examination. He decided to aspirate what he considered a perityphilitic abscess, and, if pus was found, to open and drain through the rectum; but if he failed to find pus, it was agreed that abdominal section should be resorted to. On April 28th, 1891, under chloroform the sphincter was dilated and aspirating needle inserted into the bulging tumor by Dr. Davis. About a pint of very offensive pus was drawn off. A very decided improvement in my condition was noticed. No after-effects from the anesthetic; temperature normal; pulse 90. On the third day the old symptoms began to reappear, and on May 3d a second and more thorough operation was performed. The sphincter was again stretched and incision made into the abscess cavity and a drainage tube inserted. A large quantity of pus was again removed. After that the incision was dilated every second or third day and the cavity thoroughly washed out. After about a week this treatment was discontinued and the cavity allowed to heal. A slight accumulation of pus again occurred and on May the 20th the same operation was again performed. Since then the opening has not been allowed to heal. Now, four months after the attack, I have fully recovered, with the exception of the opening, which is kept patent. The question of the advisability of an abdominal section instead of the rectal operation was considered, but as the pointing was so plain it was deemed less risky to do the operation that way."

Soon after Dr. Ransom had published this report in the *Alabama Medical and Surgical Age*, which was in July, '91, he was attacked with pain and tenderness in the right iliac region and had fever at evenings from 101 to 102 $\frac{1}{2}$  degrees. His symptoms continued to grow worse, and on the fourth day he was subjected to abdominal section and his appendix removed, in the presence of Drs. J. D. S. Davis, Whelan, Due, Glass, Whaley and several others of the Birmingham profession. After due preparation for abdominal section, a longitudinal incision 2 $\frac{1}{2}$  inches long was made parallel with the outer margin of the rectus, beginning below the level of the umbilicus. The appendix was readily found, and there was attached to it the omentum, which was

ligated and cut off. The mesentery of the appendix was incised by a double ligature of catgut and divided. Then the appendix was tied close up to the caecum and removed. The wall of the caecum was sewed over the stump of the appendix, but I think this was a mistake. I have recommended the Lembert sutures after cutting the appendix off close to the caecum, but I now think the plan of McBurney of tying off the appendix better, although I formerly preferred the other method. The operation lasted twenty-two minutes. The operation was followed by an abscess in the right iliac fossa, which had to be evacuated through the incision. I think suppuration was due to the stitches over the stump of the appendix. The doctor had septic fever before the operation, notwithstanding the appendix was not perforated, which shows that harm may result from an inflamed appendix by the passage of septic germs through its walls. Dr. Ransom is now entirely well.

The abscess should have been incised at the time it was aspirated, as I had expected to do, but after I found so much pus I was inclined to make an abdominal incision and drain from above. Afterward it was finally decided to make the incision through the rectum, inasmuch as it could be easily reached there, and as there was no evidence of its being attached to the abdominal wall.

This case is an exceedingly interesting one, as it presents so many conditions met with in appendicitis.

I will say that in the majority of severe cases of appendicitis, where there are alarming symptoms, it is far better to operate sometimes when it is not necessary than to allow our patients to take too great risks.

Peritonitis from injuries to the intestine, the bladder, the gall-bladder, the kidneys, etc., have no other remedy than surgical procedure. The time has come when all surgeons recognize the importance of opening the abdomen and repairing an injured intestine. The trouble comes in, in this class of injuries, from many surgeons advising delay in operations until after the appearance of symptoms. If a man has been shot in the abdomen they caution against an operation until there are symptoms of hemorrhage or of peritonitis, which is clearly wrong, as has been shown by many operations and by the experimental work of original investigators. My own experience in this direction would convince any one that to wait for symptoms in cases of gunshot or stab wounds of the abdomen is to wait for death; for by the time

that the symptoms, after an injury of this kind, would indicate hemorrhage or a perforation of the bowel, the patient would be so reduced and peritonitis so well established that the operation would be without avail. I can think of no subject at this time that should require the united influence of abdominal surgeons more than this of injuries to abdominal viscera from gunshot wounds, stabs, etc. So long as there is a division of sentiment among the teachers on this subject, so long will the obstructionists in every city and vicinity use their influence to prevent the aggressive surgeons from doing what they conceive to be proper in these cases. Furthermore, in this class of injuries there is generally a trial before the courts, in which the man who did the injury is tried for manslaughter or perhaps murder, and should the patient die after an operation the lawyers generally try to make it appear that the operation was the cause of death and not the injury, which would reduce a case that would otherwise be murder to perhaps one of manslaughter, if it could be proven that the operation was the probable cause of death. With the present status of the teachings in regard to these injuries it is very difficult for a surgeon to come out of the courts uncensured by the community in which he lives, should his patient die after an operation. Many doctors testify who know nothing about these lesions, who have never operated, and who only resort to the literature of those authors who are opposed to early operations in order to condemn the operation.

Dr. Senn's gas-test for detecting an injury to the intestine is not reliable, inasmuch as it does not always reveal a perforation of the bowel; and if it could be depended on to reveal a perforation, there would be no evidence that we did not have a profuse hemorrhage or an injury to some other of the viscera that should be repaired. Should it reveal a perforation we have gained nothing, because we would have to operate any way, and furthermore we would have a distension of the intestines from the gas, which would be difficult to relieve and which would add materially to the dangers of the operation. Should it not reveal an injury, we could not safely leave our patient alone without the risk of his dying from hemorrhage or some other injury to the viscera; hence, regarding his test from every standpoint, it must be concluded that it has done a great deal more harm than it has good, inasmuch as it has prevented operations that would have been done earlier had it not been for the teachings of Dr. Senn that a

man should not be operated on without the use of this test. An abdominal section is a comparatively safe procedure, its danger depending entirely upon the injury done its viscera, and in those cases where the cavity has been entered the wiser plan would be to make an exploratory incision. Should no injury be found, the patient will have had the benefit of a diagnosis, the value of which cannot be too highly estimated, although some surgeons seem to ignore the value of a section for this purpose.

The treatment of general septic peritonitis has been referred to several times in this paper and its preventive treatment dealt with, and it may be said that the preventive is the only successful one for this disease. Last year I read a paper on acute general suppurative peritonitis<sup>1</sup> before the Medical Society of the State of New York, in which I took the position that operations could not save these cases. Those who have had much experience with septic peritonitis can appreciate the statement of Hutchison, that "it is almost impossible to exaggerate our conception of the wild-fire rapidity with which inflammation of the serous membranes may extend whenever an adequate cause has been supplied"—the most important fact to remember in the treatment. Experiments on animals and the many cases of peritonitis in the human subject which I have been permitted to see, twelve, fifteen, twenty, thirty-six, forty-eight and seventy-two hours after the inception of the disease, leave no doubt on this point. I will refer briefly to only a few cases.

At the Birmingham Charity Hospital I operated twelve hours after a stab of the abdomen which perforated the bowel in four places. Peritonitis had involved one half of the cavity, the side on which the injury was received. The intestines on this side were very much inflamed and tympanitic.

I remember to have seen a case with my brother, in which he opened the abdomen fifteen hours after the man had been shot. There had been considerable escape of feces into the cavity and peritonitis was quite extensive.

In 1889 I saw, with Dr. Wyman, at the Charity Hospital, a man who had been shot in the abdomen about twenty-four hours previously. He was moribund and we did not operate. He died four hours after I saw him—twenty-four hours after the injury—and the autopsy revealed a general hemorrhagic peritonitis.

<sup>1</sup>The remarks on general suppurative peritonitis are an abstract of the author's paper read before the Medical Society of the State of New York.

During the same year I assisted Dr. Wilson at the Jefferson County Hospital in an operation for gunshot wound of the abdomen, thirty-eight hours after the injury, and there was a very intense hemorrhagic peritonitis which involved all the abdominal viscera.

If these cases teach anything it is that delay in the operation in perforating wounds of the intestine will allow a septic peritonitis to develop which cannot be relieved by surgery, and that to wait for symptoms in penetrating wounds of the abdomen is to wait for diffused septic peritonitis—which is death.

I could report many cases of peritonitis from perforation of the bowels or from the emptying of the contents of an abscess into the cavity, or from perforation of the appendix or the gall-bladder, and from other causes, to illustrate its rapid development and fatal termination, but this is not necessary, even though the length of this paper would permit of it, for the experiments of Pawlowsky, Grawitz, Wegner and others who have made acute septic peritonitis the subject of very careful study, leave but little to be added in that direction.

In diffuse septic peritonitis there is a double source of infection—the one from the general cavity, and the other from the septic germs which pass through the walls of the intestine, owing to the pathological conditions produced in the tissues of the bowel from the inflammation. Therefore it is not sufficient to remove the source of infection from the cavity, but, if possible, the contents of the intestine, in order to get rid of gas and fluids which contain septic germs, and to relieve the distended, paralyzed guts, which give rise to grave pressure symptoms—symptoms which often resemble obstruction of the bowel from mechanical causes, but which are due to dynamic disturbances.

It is often very difficult to make a diagnosis of general peritonitis, for in the great majority of cases it is a secondary disease and is greatly modified in its symptoms by the original trouble. The symptoms may be almost completely veiled by other grave conditions. The change in symptoms from a perityphilitic abscess, or a puerperal, purulent, pelvic peritonitis is often not very pronounced. But, of all the difficulties, the free use of opium furnishes the greatest—as all symptoms are masked, and the physician and family led to believe the patient better and the condition not serious.

Of the local symptoms, pain comes first. It is nearly always

present, and it is the severe, excruciating pain which first attracts attention. When the pain is local at the beginning it is of very great diagnostic value as to the cause of the inflammation. Pain, however, is not always present, and I have seen the gravest cases lying comfortable—cases in which the infection was most profound; but where there is present, in connection with pain, rigidity of the abdominal walls, distension of the abdomen and general tenderness, vomiting and eructation of gases, with marked constitutional symptoms—rapid, thready pulse, some elevation of temperature, etc.,—there can be but little doubt of the existence of general peritonitis; and if there is no recognizable cause, free purgation will, as a rule, show whether it is simple or septic. I have often seen cases where the diagnosis could not be made with any reasonable degree of certainty because morphine had been given freely, and there was no evidence that the peritonitis was not a simple inflammation or a localized inflammation with tympanites. These cases are so frequent that too much stress cannot be laid on the importance of withholding opium until after a diagnosis has been made. Some time ago I saw a very sad case of this kind in the family of one of our most prominent physicians.

I was sent for thirty-six hours after a girl, eighteen years of age, had been taken with pain in the abdomen, which had been pretty well controlled by morphine. Her pulse was 120, temperature 102.5 degrees, and there was some rigidity of the abdominal muscles, with general tenderness. She evidently had peritonitis, but I could not say that it was septic, and advised the use of calomel in large doses and enemas of glycerine and salts, and directed the attending physician to let me know in twelve hours the result of the treatment, that an operation might be done if there was not a very marked improvement. I received no message that night, but on the following morning I found a note saying that she had been purged and was better; this was Wednesday morning. On Thursday morning I received a similar message, but in the evening I was sent for and found her suffering very great pain, with a temperature of 104 degrees, pulse 140, and in a dying condition. There was no doubt then about the diagnosis, but an operation could not have offered any chance of recovery, and while the half-dozen physicians present urged me to operate, the mother of the girl was opposed to it unless we could offer more hope of saving her. An autopsy could not be had, but the attending physician informed me that a large quantity of pus came out

through the undertaker's trocar. On a close examination of the physician on my last visit I found that the improvement had never been so much as I had been led to believe, and that the tympanites, tenderness, and rigidity of the abdominal muscles had never disappeared. Had I seen the case twelve hours after my first visit I would have advised an operation. If morphine had been withheld in this case, and calomel and salines given instead, the diagnosis would have been made early and the patient in all probability saved.

In the beginning of a general peritonitis, when the bowels are tympanitic, I begin by giving a tablespoonful of salts in half a glass of water, and direct that the dose be repeated every hour until the patient is freely purged. This treatment is especially indicated in the threatened peritonitis we so often meet after laparotomies. I have seen the symptoms of a beginning peritonitis promptly cut short by the administration of a few doses of salts, or of calomel, in from one to three-grain doses, repeated hourly. If purgation does not succeed we know that an operation is generally indicated. Calomel has to be used oftener than salts, as the stomach will generally reject the salts, but it should always be accompanied with enemas of salts and glycerine.

Mears says: "Surgical interference is not justifiable and should not be instituted in cases of typhoid fever in which perforation occurs when the infective process is at its height. In mild cases of the disease in which the pyrexia has not been of high grade and in which the perforation occurs at the end of the third week or later, when the stage of convalescence is fully pronounced, laparotomy may be performed." Of the four cases of peritonitis from this cause which I have seen during the past year, not one promised anything by an operation.

Hadra has advocated in diffused septic peritonitis "open treatment, a full exposure of the abdominal cavity, which should be maintained until the danger has passed,—as much of the omentum and of the bowels as find no ready room inside should be left resting on the surface." He claims, by this method, "The cavity would be sufficiently cleansed and kept dry, the bowels to a great extent excluded, the exchange of poisonous materials diminished, the bowels, peritoneum and all the other involved organs relieved of pressure—suction of the peritoneal and diaphragmatic lymph organs would at once be greatly counteracted." He says that the irritation of the dressings over the patient's abdominal organs

need not be dreaded, as "we possess in the gutta-percha tissue a nearly ideal non-irritative air and germ tight material." In the discussion of Dr. Hadra's paper I stated that I would adopt this method in my next case; but, after a thorough study of his operation, I was convinced that it would not meet the indications for treatment so completely as the plan which I have practiced, and which will allow of the complete exposure of the abdominal cavity, the removal of the cause of inflammation, and assist in restoring the functions of the intestines.

The abdomen should be opened in the median line if the seat of the causative trouble cannot be determined; the cause, if found, removed; the cavity thoroughly douched with hot water; all adhesions broken up, and if tympanites is not marked, a glass drainage tube is introduced. If the cause be found in the region of the caecum the drainage tube should be introduced through a second incision in the right iliac region.

In those cases in which tympanites is marked, causing pressure on all the abdominal organs, and thus creating much constitutional trouble, it will require special attention, and upon this point I desire to lay great stress, for this condition is a dangerous one of itself. Not only does the weakened intestinal wall permit of the continued passage of septic germs into the peritoneal cavity and afford constant infection, but it must be remembered that the bowel cannot be replaced without great pressure and consequent traumatism, which will often kill in a few hours from shock thus induced. In advanced cases of peritonitis it must always be remembered that the walls of the intestines are rendered inactive by inflammation, and the power of contraction cannot be restored until the inflammation is relieved; and hence the bowel will continue tympanitic and exchange of septic germs be kept up unless this condition is remedied. Depaul punctuated the intestine with a fine hollow needle in cases of tympanites with dangerous pressure symptoms, and this has been recommended by many of the leading writers up to this time; even Senn refers to this as a procedure which may be resorted to. This has been tried by me a number of times, and I was never able to see an appreciable decrease in the tympanites, and it is not reasonable to suppose that a paralyzed bowel would expel any quantity of gas through a small needle. I have also practiced making incisions into the bowel after exventration, and by pressure attempted to expel the gas, but this does not prove satisfactory. The best method of

relieving a distended, paralyzed gut, full of poisonous gas, is to fill it with hot water, as this will not only free it of tympanites, but, in getting rid of the gas, feces, etc., prevents infection. The intestines should not be permitted to escape from the cavity, as their distension will grow greater the longer they are allowed to remain unsupported by the abdominal walls. The tunics being inflamed, the intestines are completely paralyzed and cannot expel their contents when incised on the outside of the abdomen; and hence this should be done with the bowels on the inside, that they may be compressed by the abdominal walls. From the time the abdomen is opened a competent assistant should begin to break up adhesions, and to direct a strong stream of hot water into all parts of the cavity, while the operator incises the intestine and washes it out. It may be necessary to make more than one opening in the bowel. Before beginning the operation the stomach should be thoroughly washed and the colon freed from its contents.

In those cases where the symptoms resemble obstruction of the bowel from mechanical causes, after the bowel has been emptied and, if possible, washed thoroughly, an artificial anus should be formed. The whole procedure can be accomplished in a remarkably short time. The following case will illustrate the treatment:

I operated on a young man five days after a perforation of the appendix. His physician had tried to relieve him with opium and poultices for four days, and then diagnosed the case to be obstruction of the bowel from invagination. When I was called the physician had begun to use purgatives and enemas, and thought that there was hope of relieving the obstruction by medicine, as the man had passed a very small quantity of feces that day. I expressed the opinion that it was a case of suppurative peritonitis, which would kill with or without operation. As the young man begged for the slightest chance an operation would promise, I opened the abdomen, incised the intestine, and allowed the escape of a large quantity of very offensive fluid and gas. At the same time the abdominal cavity was freed from a purulent fluid by hot water, which was directed in every portion of the cavity. The incised gut was stitched to the lower angle of the abdominal wound, and a drainage tube introduced through the upper angle. The artificial anus was made in the median line, that the recti muscles might aid in retaining the contents of the intestine. The patient lived until the next day.

There is often an obstruction in the ileo-caecal region from adhesions produced by the inflammatory process, which has caused the peritonitis, and in such a case I have done an anastomosis by uniting the lower part of the ileum with the ascending colon.

In 1889 I adopted this plan in a case of suppurative peritonitis due to the rupture of a perityphilitic abscess, in which there was a compound flexion of the ileum in the ileo-caecal region from very strong adhesions. The peritonitis was well developed and the tympanites was very great. After the abdominal cavity was thoroughly irrigated and the bowel emptied of its contents, as the patient was holding up well, to avoid the necessity of resorting to the formation of an artificial anus, I requested my brother to do an anastomosis with his catgut mats. The ileum was united with the ascending colon in a very few minutes. Three hours after the operation the patient had a small fecal action and passed a large quantity of gas. He lived fourteen hours after the operation. I would not now recommend this procedure in similar cases, but would make an artificial anus.

In a paper read before the Alabama Medical Association two years ago, in addition to the plan of operating suggested here, I recommended that in some cases where the artificial anus was resorted to that the ileum should be flexed and an anastomosis done eight or ten inches from the seat of the proposed anus, so that when it became necessary to close the artificial anus this could be done, after the anastomosis, without interfering with the flow of the intestinal contents. Since I read that paper, more extended experiments with the operation have taught me that in the cases in which it would be indicated the patient's condition would not permit of the extra time required for its performance, and hence it is now my opinion that it will never be indicated. In fact, operations for this form of peritonitis are very questionable, as they offer so little hope of recovery.

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